



UNITED STATES PATENT AND TRADEMARK OFFICE

12

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,983	08/27/2003	Philippe Le Helley	BDL-433XX	4351
207	7590	03/17/2005		
WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP TEN POST OFFICE SQUARE BOSTON, MA 02109			EXAMINER KIM, TAE JUN	
			ART UNIT	PAPER NUMBER
			3746	
DATE MAILED: 03/17/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,983

Applicant(s)

LE HELLEY ET AL.

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-17 and 22-26 is/are rejected.
- 7) ☒ Claim(s) 5-9 and 18-21 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 10-17, 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cherry et al (3,795,106) in view of Calabro et al (6,148,610). Cherry et al teach a system for passively controlling pressure oscillations of hydrodynamic origin (col. 2, lines 1+) in a solid propellant thruster comprising a body containing a charge of solid propellant 18, the system comprising at least one insert 24 disposed in said thruster body transversely relative to a combustion gas flow channel formed in the solid propellant charge, said insert including a single opening 26 in order to prevent turbulent modes from forming in the thruster. Cherry et al also teach:

“Through the use of baffles in combination with a segmented cartridge-loaded grain design, barriers between the segmented grains are provided, thus the baffles serve to basically provide a physical flow obstruction which is oriented perpendicular to the longitudinal axis of the motor, with provision for throughflow of combustion products. The through-flow provision is an aperture in the baffle to allow the gases to pass therethrough. The baffles accomplish their function by altering the fundamental acoustic characteristics of the motor chamber, encompassing, in effect, the acoustic and combustion fields. *The baffle may be of a disc configuration with simply a hole in the center, or of such other design as necessary to adapt to a given grain perforation shape.*

For example, the grain may be star-shaped in the center, thus, the aperture in the center of the baffle could be star-shaped to suit the star-grain of the segmented cartridge-loaded grain design. The baffles may be fabricated from many heat resisting materials, for example, various phenolic composites could be used including asbestos, silica, carbon, and graphite (not usually used with phenolic) and could be of composite construction, i.e., metal reinforced phenolic composites, etc. The selection of the material for the baffles would depend on the flow conditions (pressure, temperature, and duration) of a particular application.” (col. 2, lines 16-43).

It is clear that the opening of Cherry et al may be circular or of other design or star shaped. Calabro et al teach making the propellant charge profile of different shapes depending on its location (see Figures 4A – 4D) and including non-axisymmetric shapes including star shaped and crenellations (see Figures 4A – 4D) to see the change in the shape along its profile, which reduces the pressure and thrust oscillations (col. 2, lines 25+). It would have been obvious to one of ordinary skill in the art to make the insert of different shape than the gas flow channel to control the pressure and thrust oscillations. The function of “so as to generate a three-dimensional effect on the flow in order to prevent axisymmetric turbulent modes from forming in the thruster” is an inherent result of the non-axisymmetric aperture. The non-axisymmetric opening of the insert is present in the flow channel throughout the duration of the combustion of the solid propellant charge; said non-axisymmetric opening of the insert appears in the flow channel from a predetermined instant (the beginning) of the combustion of the solid propellant charge. Plural propellant blocks are used but making the propellant blocks and insert integral or a

single block, is as an obvious matter of making them integral. It would have been obvious to one of ordinary skill in the art to make the propellant and insert integral or a single block as an obvious matter of making integral, in order to reduce parts. As for the propellant blocks being inhibited, this is well known in the art as taught by GB 1605168 (page 1, lines 62+). It would have been obvious to one of ordinary skill in the art to use an inhibited coated block in order to prevent combustion until desired. As for making the insert rigidimer composite, this is a material well known in rockets and would have been obvious to employ as a well known type of material used in the art.

3. Claims 1, 4, 10-15, 17, 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stark (3,423,943) in view of Calabro et al (6,148,610). Stark teaches a solid propellant thruster comprising a body containing a charge of solid propellant 18, the system comprising at least one insert 26 disposed in said thruster body transversely relative to a combustion gas flow channel formed in the solid propellant charge, said insert including a single opening 28. Stark does not teach the single opening is of different shape than the flow channel, but he does show that the turbulence (eddies around each insert 26) is non axisymmetric and 3D, such a configuration inherently reduces the noise. Stark does not teach the single opening in the insert is of different shape than the flow channel. Note that Stark's insert 28 is a propellant as well. Calabro et al teach making the propellant charge profile of different shapes depending on its location (see Figures 4A – 4D) and including non-axisymmetric shapes including star shaped and crenellations (see Figures 4A – 4D) to see the change in the shape along its

profile, which reduces the pressure and thrust oscillations (col. 2, lines 25+). It would have been obvious to one of ordinary skill in the art to make the insert of different shape than the gas flow channel to control the pressure and thrust oscillations. Said non-axisymmetric opening of the insert appears in the flow channel from a predetermined instant (the beginning) of the combustion of the solid propellant charge. Plural propellant blocks are used but making the propellant blocks and insert integral or a single block, is as an obvious matter of making them integral. It would have been obvious to one of ordinary skill in the art to make the propellant and insert integral or a single block as an obvious matter of making integral, in order to reduce parts. As for the propellant blocks being inhibited, this is well known in the art as taught by GB 1605168 (page 1, lines 62+). It would have been obvious to one of ordinary skill in the art to use an inhibited coated block in order to prevent combustion until desired. As for making the insert rigidimer composite, this is a material well known in rockets and would have been obvious to employ as a well known type of material used in the art.

Allowable Subject Matter

4. Claims 5-9, 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler, can be reached on 571-272-4834.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



Ted Kim	Telephone	571-272-4829
Primary Examiner	Fax (Regular)	703-872-9306
March 7, 2005	Fax (After Final)	703-872-9306
Technology Center 3700 Receptionist	Telephone	703-308-0861
Patents Assistance Center	Telephone	800-786-9199